

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

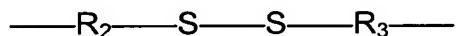
LISTING OF CLAIMS:

1. (Currently Amended) A composite electrolyte membrane comprising a modified silica in which silicon atoms have substituents as represented by formula 1 and formula 2; and [[an]] a cation exchange group-containing polymer:

Formula 1



Formula 2



wherein, R₁ is an alkylene group with 2-7 carbon atoms, X is a hydrogen atom or an alkali metal, R₂ and R₃ are each independently an alkylene group with 2-7 carbon atoms.

2. (Original) The composite electrolyte membrane according to claim 1, wherein the content of the modified silica is 2 to 20% by weight.

3. (Currently Amended) The composite electrolyte membrane according to claim 1, wherein ~~the grain size of the modified silica~~ [[is]] has a grain size of about 2 to about 10 nm.

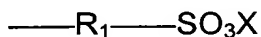
4. (Original) The composite electrolyte membrane according to claim 1, wherein the cation exchange group in the polymer is selected from a sulfonate group, a carboxyl group, a phosphate group, an imide group, a sulfonimide group, and a sulfonamide group.

5. (Currently Amended) The composite electrolyte membrane according to claim 1, wherein the cation exchange group-containing polymer is a highly fluorinated polymer which has a sulfonate group as an cation exchange group on one end of the a side chain, and in which fluorine atoms amount to at least 90% of the a total number of fluorine and hydrogen atoms bound to carbon atoms of the backbone and side chains of the polymer.

6. (Currently Amended) A fuel cell comprising a cathode; an anode; and an electrolyte membrane being placed between the cathode and the anode,

the electrolyte membrane being a composite electrolyte membrane comprising a modified silica in which silicon atoms have substituents as represented by formula 1 and formula 2; and an a cation exchange group-containing polymer:

Formula 1



Formula 2



wherein, R_1 is an alkylene group with 2-7 carbon atoms, X is a hydrogen atom or an alkali metal, R_2 and R_3 are each independently an alkylene group with 2-7 carbon atoms.

7. (Previously Presented) The fuel cell according to claim 6, wherein the content of the modified silica is 2 to 20% by weight.

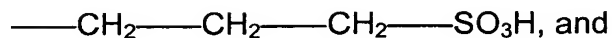
8. (Currently Amended) The fuel cell according to claim 6, wherein ~~the grain size of~~ the modified silica ~~[[is]]~~ has a grain size of about 2 to about 10 nm.

9. (Previously Presented) The fuel cell according to claim 6, wherein the cation exchange group in the polymer is selected from a sulfonate group, a carboxyl group, a phosphate group, an imide group, a sulfonimide group, and a sulfonamide group.

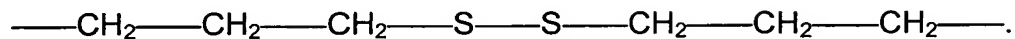
10. (Currently Amended) The fuel cell according to claim 6, wherein the cation exchange group-containing polymer is a highly fluorinated polymer which has a sulfonate group as ~~[[an]]~~ a cation exchange group on one end of ~~[[the]]~~ a side chain, and in which fluorine atoms amount to at least 90% of ~~[[the]]~~ a total number of fluorine and hydrogen atoms bound to carbon atoms of ~~[[the]]~~ backbone and side chains of the polymer.

11. (New) The composite electrolyte according to claim 1, wherein

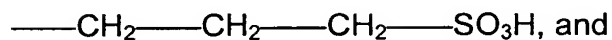
Formula 1 is



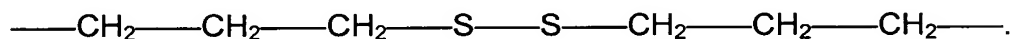
wherein Formula 2 is



12. (New) The fuel cell according to claim 6, wherein Formula 1 is



wherein Formula 2 is



13. (New) A fuel cell comprising:

a cathode;

an anode; and

a composite electrolyte membrane comprising:

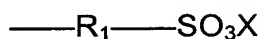
a cation exchange polymer; and

a modified silica, wherein the modified silica comprises silicon atoms bonded to a propane sulfonates group and a disulfide group.

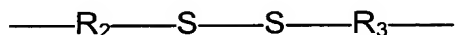
14. (New) The fuel cell according to claim 13, wherein the modified silica comprises silicon atoms bonded to a propane sulfonates group on one side of the modified silica and a disulfide group on another side of the modified silica.

15. (New) The fuel cell according to claim 13, wherein the propane sulfonates group is represented by Formula 1 and the disulfide group is represented by Formula 2:

Formula 1



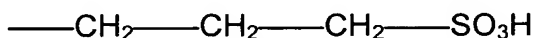
Formula 2



wherein R₁ is an alkylene group with 2-7 carbon atoms, X is a hydrogen atom or an alkali metal, R₂ and R₃ are each independently an alkylene group with 2-7 carbon atoms.

16. (New) The fuel cell according to claim 13, wherein the propane sulfonates group is represented by Formula 1 and the disulfide group is represented by Formula 2:

Formula 1



Formula 2



17. (New) The fuel cell according to claim 13, wherein the cation exchange group in the polymer is selected from a sulfonate group, a carboxyl group, a phosphate group, an imide group, a sulfonimide group, and a sulfonamide group.

18. (New) The fuel cell according to claim 13, wherein the cation exchange group-containing polymer is a highly fluorinated polymer which has a sulfonate group as a cation exchange group on one end of the side chain, and in which fluorine atoms amount to at least 90% of the total number of fluorine and hydrogen atoms bound to carbon atoms of backbone and side chains of the polymer.

19. (New) The fuel cell according to claim 13, wherein the composite electrolyte membrane comprises about 2 wt% to about 20 wt% modified silica.

20. (New) A method of preparing a composite electrolyte membrane, comprising:

forming a solution comprising a sulfur containing composition and a solvent;
placing an electrolyte membrane in the solution to form a mixture;
adding a silane containing composition to the mixture; and
removing the composite electrolyte membrane with a disulfide group and/or sulfonates group bonded to a silicon atom in the composite electrolyte membrane.